

Space News Roundup

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No. 1

JSC recognized for efforts to advance women in management

By Eileen Hawley

Efforts at facilitating the advancement of women into management positions earned JSC the 1993 Excellence Award from the Greater Houston Women's Foundation.

The award was presented to Carolyn Huntoon, director, Space and Life Sciences, at a December awards ceremony. JSC was the sole public sector recipient from three nominated. Nine private sector organizations also were nominated for

the award. Excellence Awards in the private sector were presented to Xerox Corp., Hoechst Celanese Corp. and Tenneco Gas.

Award nominees were selected based on results of more than 1,000 surveys sent to Houston area corporations employing more than 200 people. Representatives from the Greater Houston Women's Foundation then made site visits to the top 12 organizations "looking for the unique things that each specific

organization had done for the advancement of women" in the workplace, said Deputy Director of Equal Opportunity Programs Estella Gillette.

Programs such as JSC's child care facility were cited as examples of positive steps designed to allow women to feel more comfortable working outside the home. "JSC has more women in management than ever before," said Gillette. "About one-third of the population at JSC is

female and the expectation is that more will be moving into higher positions."

The "Project Breakthrough" survey was conducted by the GHWF under the auspices of the University of Houston, College of Business Administration, Institute for Diversity and Cross-Cultural Management. In addition to JSC and the three private sector winners, nominees included Bellaire Hospital, Houston Lighting & Power Co., the Houston Marriott,

South Loop, the Houston Post, Pitney Bowes, Texaco U.S.A., Xerox Corp., the Houston Community College System, and the University of Texas M.D. Anderson Cancer Center.

The GHWF was established to fund programs benefiting women and to educate women in money management and philanthropy and was one of two Houston organizations which benefited from Oprah Winfrey's recent fundraising shows.

Probes continue to explore space

Galileo and the Earth are once again approaching each other, although Galileo continues to recede from the Sun on its way to Jupiter. The spacecraft, in excellent condition with the exception of its partially deployed high-gain antenna, is now 406 million miles from Earth and 348 million miles from the Sun. The distance from Earth will reach a minimum in early May and then start to increase.

Magellan is in orbit around Venus with altitudes of 122 to 336 miles, and has been mapping the planet's gravitational field through precision tracking since the orbit was achieved through aerobraking earlier this year. Spacecraft condition is very good.

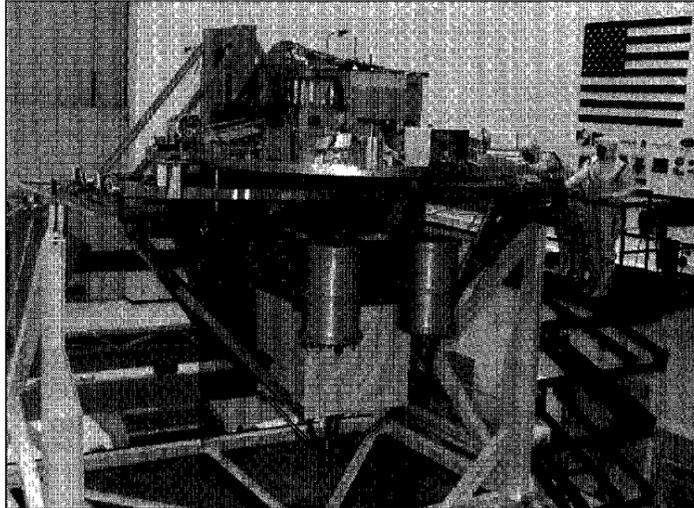
Topex/Poseidon is healthy, and all scientific instruments are performing normally. The mission is to map global sea level changes, reflecting seasonal warming and cooling and winds.

Ulysses is in a highly inclined solar orbit, now almost 49 degrees south relative to the Sun's equator and about 337 million miles from Earth, following a gravity assist flyby at Jupiter in February 1992. Ulysses will make solar polar passages (about 80 degrees south and north) in 1994 and 1995. Spacecraft condition and performance are excellent, with Ulysses gathering data on the heliosphere — the realm dominated by the solar wind.

Voyager 1 and 2 are continuing their interstellar mission, taking data on magnetic fields and charged particles as well as ultraviolet data. Voyager 1 is 5.13 billion miles and Voyager 2 is 3.98 billion miles from Earth.



DOUBLE CHECK— The STS -60 crew, from left Ron Sega, Sergei Krikalev, Charlie Bolden, Franklin Chang-Diaz, Ken Reightler, and Jan Davis, inspect some of the tools they will use during their upcoming mission. Workers at Kennedy Space Center prepare to rotate the Wake Shield Facility to a vertical position prior to its move to Launch Pad 39A



First shuttle flight of 1994 being readied

By James Hartsfield

Preparations for a busy shuttle year were off to a rolling start at Kennedy Space Center this week as *Discovery* was rolled out of its processing hangar to be hoisted skyward and joined with its solid rockets and fuel tank for STS-60, the first shuttle mission of 1994 on track for an early February launch.

STS-60 will be the first flight of the Wake Shield Facility, the second Spacehab module flight, and the first shuttle flight to carry a Russian Space Agency cosmonaut aloft. The Wake Shield Facility is waiting for *Discovery* at Launch Pad 39A, where it will be installed once the shuttle stack is moved to the pad early next week.

The launch preparations will then move into high gear, with the next milestone to be a visit by the STS-60 crew for a count-down dress rehearsal Thursday and Friday. Shuttle managers will meet for the agency-wide final flight readiness review of all mission preparations on Jan. 25, following which an official launch date will be announced.

Elsewhere this week, work to prepare *Columbia* for the second shuttle mission of 1994, currently targeted for an early March launch, continued in the Bay 2 processing hangar at KSC. *Columbia* will carry the United States Microgravity Package and the Office of Aeronautics and Space Technology package aloft for their second respective flights.

Work on *Columbia* this week included powering up the spacecraft, opening the payload bay doors, testing the Ku-band antenna and checking the crew hatch. Next week, the orbiter's three main engines will be installed.



Team to investigate radiation tests

JSC-led team to investigate whether agency sponsored tests

NASA Administrator Daniel S. Goldin on Monday established a team to investigate whether NASA was involved in experiments to determine the effects of radiation on humans.

The team, led by JSC Deputy Director of Space and Life Sciences Don Robbins, will conduct a prompt, detailed search of all NASA records concerning human experiments involving radiation.

NASA also is participating in an inter-agency group that is taking a government-wide look at federal involvement in radiation research on humans.

Harry Holloway, associate administrator for life and microgravity sciences and applications, has been assigned primary responsibility for overseeing all of NASA's internal activities regarding human experimentation on the effects of radiation.

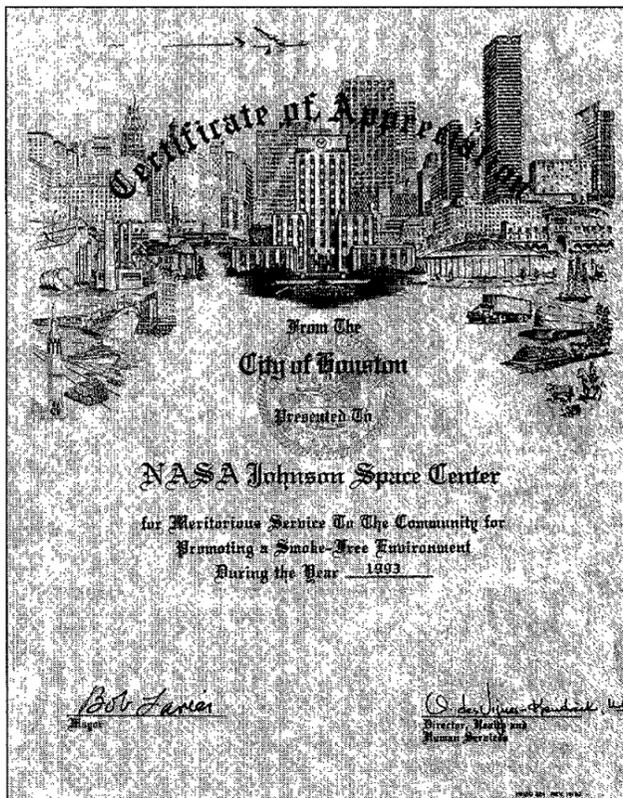
Goldin said the Department of Energy informed his office Dec. 30 that NASA had been involved in sponsorship or co-

sponsorship of some experiments to determine the effects of radiation on humans.

"I personally consider this issue to be of paramount concern and will ensure that any involvement by NASA is fully disclosed to the American public," he said.

"Today's NASA prides itself on its openness, its relevancy and its positive impact on the quality of life for all people," Goldin added. "There is no place in this agency for human medical experimentation conducted in secrecy or without full respect for the human dignity of each and every participant. I guarantee the American public a full accounting of all radiation experiments conducted on human subjects by this agency."

Robbins' investigative team will report to Holloway and cooperate fully with external review bodies, the Department of Energy and other federal agencies involved in the issue.



City honors JSC for smoke-free environment

The City of Houston recently presented JSC with a certificate of appreciation for "meritorious service to the community in promoting a smoke-free environment" during 1993.

The certificate was signed by Mayor Bob Lanier and Dr. Mary Kendrick, director of Health and Human Services.

"JSC is happy to provide a smoke-free environment for its employees," said Acting JSC Director Paul J. Weitz. "Everyone has had to make accommodations, and it is this willingness to cooperate that has made the transition to a smoke-free environment relatively smooth," Weitz added.

JSC instituted its centerwide policy prohibiting smoking in buildings on Jan. 1, 1991. The Employee Assistance Program offers smoking cessation classes to help those who wanted to quit.

JSC

Ticket Window

The following discount tickets are available for purchase in the Bldg. 11 Exchange Store from 10 a.m.-2 p.m. Monday-Thursday and 9 a.m.-3 p.m. Friday. For more information, call x35350 or x30990.

Moody Gardens — Discount tickets for two of three different attractions: \$9 Entertainment '94 Coupon Books — Bay Area/Galveston/Downtown or FM 1960/Downtown: \$30 each, \$1 off first book for civil servants. Gold C Books: \$8 Space Center Houston — Discount tickets: adult, \$7.50; child (3-11), \$4.50; commemorative, \$9.95.

Metro tickets — Passes, books and single tickets available.
Movie discounts — General Cinema, \$4.50; AMC Theater, \$3.75; Loew's Theater, \$4.
Stamps: Book of 20, \$5.80.

JSC

Gilruth Center News

Sign up policy — All classes and athletic activities are first come, first served. Sign up in person at the Gilruth Center and show a NASA badge or yellow EAA dependent badge. Classes tend to fill up two weeks in advance. Payment must be made in full, in exact change or by check, at the time of registration. No registration will be taken by telephone. For more information, call x30304.

EAA badges — Dependents and spouses may apply for photo identification badges from 6:30-9 p.m. Monday-Friday. Dependents must be between 16 and 23 years old.

Weight safety — Required course for employees wishing to use the weight room is offered from 8-9:30 p.m. Jan. 12. Pre-registration is required. Cost is \$5.

Defensive driving — Course is offered from 8:15 a.m.-3 p.m. Saturday. Next class is Jan. 8. Cost is \$19.

Aerobics — High/low-impact class meets from 5:15-6:15 p.m. Tuesdays and Thursdays. Cost is \$32 for eight weeks.

Exercise — Low-impact class meets from 5:15-6:15 p.m. Mondays and Wednesdays. Cost is \$24 for eight weeks.

Aikido — Martial arts class meets from 5-7:30 p.m. Tuesdays and 6:15-8:15 p.m. Wednesdays. Black Belt class from 6-8 p.m. Fridays, requires instructor permission. Cost is \$25 per month.

Western dance — Country and western dance classes begin Jan. 3. Beginner class meets from 7-8:30 p.m. Mondays and advanced class meets from 8:30-10 p.m. Mondays. Cost is \$20 per couple for six weeks.

Line dance — Classes meet from 7-8 p.m. Tuesday nights beginning Jan. 4. Cost is \$10 per person for six weeks.

Ballroom dance — Classes begin Jan. 6. Cost is \$60 per couple for eight weeks.

Fitness program — Health Related Fitness Program includes a medical examination screening and a 12-week individually prescribed exercise program. For more information, call Larry Weir at x30301.

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Dates & Data

Today

Paper call — Paper abstracts for presentation at the FAA/NASA International Symposium on Advanced Structural Integrity Methods for Airframe Durability and Damage Tolerance are due Jan. 7. The conference will begin May 4. For additional information, contact Charles Harris at (804) 864-3449 or Doris Stroup at (804) 722-0330.

Cafeteria menu — Special: fried chicken. Total Health: vegetable lasagna. Entrees: broiled cod fish, beef stroganoff, vegetable lasagna. Vegetables: steamed broccoli, carrots vichy, Italian zucchini, breaded okra.

Sunday

Chorus auditions — The Bay Area Chorus will hold auditions for its 1994 Spring Season from 3-5 p.m. and 9-9:30 p.m. Jan. 9 at Clear Lake Presbyterian Church. For additional information, contact Gayle Brown at 684-6030.

Monday

Cafeteria menu — Special: meat sauce and spaghetti. Total Health: potato baked chicken breast. Entrees: wieners and sauerkraut, sweet and sour pork chop, potato baked chicken, steamed fish, French dip sandwich. Soup: cream of asparagus. Vegetables: French cut green beans, seasoned rice, California vegetables, buttered beans.

Tuesday

Cafeteria menu — Special: smothered steak with dressing. Total Health: shrimp creole over rice. Entrees: beef stew, liver and onions, shrimp Creole, baked chicken, French dip sandwich. Soup: navy

bean. Vegetables: steamed rice, seasoned cabbage, corn O'Brien, peas, potatoes au gratin.

Wednesday

PSI meets — The Clear Lake/NASA area chapter of Professional Secretaries International meets at 5:30 p.m. Jan. 12 at the Holiday Inn, NASA Road 1. The program discusses CPS recertification. For additional information, contact Elaine Kemp, at x30556.

Astronomy seminar — The JSC Astronomy Seminar will meet at noon Jan. 12 in Bldg. 31, Rm. 129. For more information, call Al Jackson, 333-7679.

Cafeteria menu — Special: salmon croquette. Total Health: vegetable plate. Entrees: roast pork, baked perch, steamed fish, vegetable lasagna, Reuben sandwich. Soup: seafood gumbo. Vegetables: mustard greens, okra and tomatoes, vegetable sticks, lima beans.

Thursday

Russian speakers — Practice Russian language skills from 11 a.m.-1 p.m. Jan. 13 in the Bldg. 3 cafeteria. For more information, call Jack Bacon, x38725, or Amy Mendez, x38066.

Blood drive — The first blood drive of 1994 will be from 8:30-11:30 a.m. Jan. 13 at Krug and from 1:30-4:30 p.m. at Barrios. For additional information, contact Beth Brumley at 212-1204 or Tom Hanson at 244-7473.

Cafeteria menu — Special: stuffed cabbage rolls. Total Health: oven crisp cod. Entrees: beef tacos, ham and lima beans, pork and beef egg rolls, steamed fish, French dip sandwich. Soup: beef and barley. Vege-

tables: Brussels sprouts, green beans, buttered squash, pinto beans.

Friday

Cafeteria menu — Special: baked chicken. Total Health: roast beef au jus. Entrees: deviled crab, Creole baked cod, baked chicken, beef cannelloni, Reuben sandwich. Soup: seafood gumbo. Vegetables: seasoned carrots, peas, breaded okra, steamed cauliflower.

Jan. 15

Sky watch — The JSC Astronomical Society and Challenger 7 Memorial Park will have telescopes available for the public to view the winter sky from dusk to 10 p.m. on Jan. 15. For more information, call Bill Williams, 339-1367, evenings.

Jan. 16

Chorus auditions — The Bay Area Chorus will hold auditions for its 1994 Spring Season from 3-5 p.m. and 9-9:30 p.m. Jan. 16 at Clear Lake Presbyterian Church. For additional information, contact Gayle Brown at 684-6030.

Jan. 17

MLK Day — Most JSC offices will be closed in observance of the Martin Luther King Holiday.

Jan. 18

Speech contest — The Loral Chapter of the National Management Association will host the opening round of the American Enterprise Speech Contest for high school students with dinner at 5:30 p.m. and speeches beginning at 7 p.m. at the Lakewood Yacht Club. For reservations and information, contact Mary Jane Powell, at 335-2739.

Swap Shop

Swap Shop ads are accepted from current and retired NASA civil service employees and on-site contractor employees. Each ad must be submitted on a separate full-sized, revised JSC Form 1452. Deadline is 5 p.m. every Friday, two weeks before the desired date of publication. Ads may be run only once. Send ads to Roundup Swap Shop, Code AP3, or deliver them to the deposit box outside Rm. 147 in Bldg. 2. No phone or fax ads accepted.

Property

Sale: LC/Britany Bay, 3-2-2, lg kitchen, DR, family room, and master bath w/oval tub & shower, \$86.5k. David, 282-3827 or 554-5514.

Rent: Galveston condo, furn, sleeps 6, Seawall Blvd and 61st St, wknd/wkly, dly, Magdi Yassa, 333-4760 or 486-0788.

Rent: Arkansas cottage overlooking Blue Mountain Lake, furn, wooded, 4 ac, screened porch, antiques, \$250/wk, \$50/day. x33005 or 334-7531.

Sale: Taylorcrest, 4-3-2.5D, southern colonial, 3200 + sq ft, pool/spa, water view on cul-de-sac, island kitchen, balconies, art studio, \$290k, 4% co-op, Richard, x30271 or 326-4963.

Sale/Lease: Nassau Bay, 4-2-2, recently remodeled, trees, \$795/\$114.5. Minh, 333-6806 or 484-2456.

Rent: Wolf Creek, Southern CO, 2BR, furn, sleeps 5, no smoking/no pets, day/wk/mo. Bob, x30825 or 998-7372.

Rent: Room in Seabrook, price negotiable. 474-1455.

Sale: El dorado Trace condo, 1-1.5-CP, all appl, patio, FPL, fans, low equity, assumable. Jerene, 488-3383 or 764-0185 pager.

Rent: Piper's Meadow, 3-2-2, no pets allowed, \$750/mo + dep. 480-270.

Sale: Camino South, 3-2-2, fenced, trees, quite, cul-de-sac, \$79k. x33433 or 471-6175.

Sale: Heritage Park Village, 3-2-2, 1850 sq ft, both formals, FPL, fans, jacuzzi, storage, \$92.5k. x49777 or 901-5675.

Sale: Meadow Green, 3-2.5-2, gameroom, landscaping, \$126.9k. 286-7184.

Sale: 1500 Bay Area Blvd, condo, 1 BR, FPL, W/D hook-up, comp remod, \$26.9k. John, 333-4114 or 333-4144.

Sale: San Leon, mobil home, 3-2, appl incl/part furn, Pecan Park, \$17k. or OBO. x38138 or 559-1437.

Sale: Lake Livingston 2 lots, owner fin, \$5k. James, x36666.

Sale: Meadow Green, 4-2.5-2, 2900 sq ft, lg cul-de-sac, yd, lg deck, both formals, wet bar, game room, FPL, fans, \$133k. x36881 or 486-5246.

Sale/Lease: Baywind I Condo, 2-2, FPL, W/D, all util paid except light, \$495 + \$500 dep or \$36k, owner finance. 339-2283.

Sale: Lake Travis lot, all utilities, pool, golf course, tennis, marina. Nasser, x33685 or 334-1032.

Sale: Clear Lake Shores, 3-2 on wooded lot, recently painted, oak floors, lg kitchen, decks, fans, separate workshop, \$89.7k. 538-1849.

Cars & Trucks

'91 Mercedes 190E-2.3, 5 spd, rare, ex cond, 32k mi, alarm, wind tint, sheepskins, \$19.9k. Dave, 333-6818 or 486-6859.

'88 Dodge Grand Caravan LE, gray, 57k mi,

\$5.5k. 486-5826.

'78 Porsche 928, brown w/leather int, auto, exc cond, 75k mi, \$8.5k. Bill, x48889.

'88 Honda Accord LX, ex cond, 67k mi, PW/locks, new brakes/tires, \$6,995. x32567 or 488-3314.

'84 Nissan 300ZX, 87k mi, 5 spd, silver w/T-tops, \$4.2k. x39045 or 488-2676.

'92 GEO Prizm, 4dr, A/C, AM/FM, auto, like new, leaving country, \$7.5k. Tom, 326-1217.

'78 Pontiac Grand Prix, 78k orig mi, 1 owner, ex cond, \$2k. OBO. 538-1399.

'88 Winnabago Elandan, 34', 32k mi, new tires, sleeps 6, 2 A/C's, 2 stereos, microwave, CB, ex cond, \$3.5k. x33433 or 471-6175.

'86 Hyundai Excel, 5 spd, 4 dr, A/C, AM/FM/cass, good cond, 70k mi, \$2k. Denise, x31846 or 486-5146.

'92 Mercury Sable, 14.5k mi, loaded, maintenance records, \$12.3k OBO. Albert, x46112 or 772-3207.

'93 Jeep Wrangler, red, 4.0L, 5 spd, AM/FM/cass, w/stereo sound bar, low mi, \$13k. 579-1035.

'87 Ford Tempo, needs work. 338-1040.

'54 Chevy PU, restored, \$4.5k. 282-3479 or 532-1112.

'89 Honda NX125, dual-purpose, one owner, ex cond. \$1.5k. 474-4763.

Boats & Planes

22.5' Sea Ray Cuddy cruiser, 228 hp Mercruiser I/O, Color Furuno depth finder, VHF, ex cond, \$8.5k. Mark, x38013 or 992-4132.

U.S. Yachts 22' sloop w/4.5 hp eng, 2 sails, galley, sleeps 5, ex cond, \$5,399. Russ, x45979 or 332-1769.

23' Galaxy power boat w/trailer, well kept. 474-1455.

18' Prindle w/trlr, new sails, dbl trapeze, ex cond, \$1.4k OBO; 22'4" Gulf Coast sailboat, fixed keel, main, jib, & spinnakers, new upholstery, 6HS Johnson, new bottom job & hull paint, \$2k OBO. Greg, x35560 or 474-7634.

Pietenpol Air Camper, open ckpt, hi wing, 65hp, 4gal/hr at 85mph, \$9.5k. (214) 241-7184.

Cycles

Girl's 10 spd bike, \$15; boy's 10 spd bike, ex cond, \$30. Debbie, x36034 or 332-5709.

Girl's 12 spd 27" FS-12 Free Spirit bike, 1 yr old, ridden 3 times, \$100. Jack Mays, x49606 or 538-1989.

Audiovisual & Computers

BM PC, 640k, 2-51/4 FD, no HD, 13" monitor color, kybd, S/W, IBM Proprinter, paper, \$250. Michelle, x31109 or 474-7263.

IBM PS/2 Model 25, mono monitor, 2-1.4 MB FD, 512 RAM, no HD, ex cond, \$300; Sony CD player w/remote ctrl, programmable, ex cond, \$150. X38516 or 482-8820.

Seagate ST157N 49 MB HD (SCSI) w/ctrl card, \$150; 2400 baud internal modem, \$125. 764-7013 or 992-5859.

Turbo Graphics 16 & access, plus Legendary Axe, 1 & 2, Vigilante & Keith Courage games, all or none, \$80. 713-554-6200.

PC software, MS DOS 6.0, \$25; Xtree Pro Gold 2.0 \$10. Mark, x30044.

Compaq DeskPro/PC, 486 DX/2 66 MHz, SVGA monitor 14" P22, 0.28mm resolution 1224 x 768, 800 x 600, 640 x 480, sound card

& extrn jacks, three expan slots, 1.44 MB 3.5" dr, 4 MB mem expand to 32 MB, 256k of cache, VRAM expan, all Compaq, 170 MB HD, \$1,250. w/o HD, \$1k. 332-6194.

Commodore 64 computer, kybd, printer, modem, software, will sell indiv components, BO. Bob, 283-1193 or 326-5616.

286-12, 7 MB RAM, 60 MB HD, Samsung EGA monitor, Star NX-1000 printer, 2400 baud modem, kybd and mouse, \$400. Kim, x34741 or 482-8487.

Sanyo stereo rack system w/receiver, turntable and dbl cass deck, good cond, \$50. x38960.

RCA Pro 8 video camera w/ex batt and charge plus many extras, \$550. 482-6879.

Packard-Bell 386 16 MHz computer, 40 MB HD, 3.5" and 5.25" FD, 1 MB RAM, VGA monitor, \$400. 641-3067.

Onkyo 45 w/channel, \$75; Pioneer CD, \$50; Microacoustic speakers, 10"/3 way, \$125; Technics auto turntable, \$50. Ken, 333-7167 or 785-8359.

Photographic

Bronica SZA medium format SLR camera, 50mm, 80mm, 135mm, Nikkor lenses, A12, film back, \$1k. Kevin, 283-1296 or 532-1409.

Canon AE-1 camera, Canon f1.8 lens, Vivatar 28-200mm lens, Canon case, \$325 OBO. Pat, 482-6634.

Olympus OM-PC 35mm camera w/50mm f1.8 lens, case, ex cond, \$160; Mamiya ZE-X 35mm camera w/50mm f1.7, 28-50 zoom, and 80-200 zoom lenses, misc equip, all manuals and boxes, \$360. Jeff, 333-7007 or 326-5098.

Musical Instruments

Richenbacher bass guitar, \$200. 339-1957.

Cassio CT-615 elect kybd, stand, stool, AC adapt, carrying case, sustain pedal, was \$300, now \$225. 481-6928.

Akai AX-60 kybd, \$300; kybd stand, \$70; NTX-9 Simmons drum expander, \$110; Suzuki drum machine \$50; Casi midi sequencer, \$50. x38675 or 688-6781.

Pets & Livestock

Bunny rabbits, free. x31883.

Fuzzy Lop rabbits, show quality, feed & instr incl. 554-6200.

Registered AKC mini toy Poodle, fem, 1 yr, all shots. B.J., x36562 or 947-8415.

Registered AKC Lhasa Apso, approx 2 1/2 yrs, good w/children, free. Bob, 474-5186 or 338-2075.

Angora hamsters, long hair, show quality, pedigree papers. 486-5286.

Four yr old fem Siamese cat, spayed, free. Linda, 337-5921.

Ten yr old Himalayan longhair house cat, declawed, neutered male, blk, free. 554-6379.

Household

Heavy country pine breakfast table & four chairs, two ext leafs, \$150; kg sz bed, solid pecan headboard & frame, \$75. Dave, x31146.

Kg sz solid oak water bed/eight drw capt pedestal, was \$2.5k, now \$700 OBO. Gary, 482-3669.

Queen Anne dining table w/6 chairs & 3 leaves, ex cond, \$700. X35751 or 332-2092.

Thomasville formal DR table & 6 chairs + 2 leafs, 6' china cabinet, ex cond, \$1k. 334-3066.

Matching formal couch & loveseat, beige & peach, ex cond. Diana, x38680 or 427-7983.

Emerson 19" color TV, remote, elect tuning, 16" x 31" x 28" solid wood TV/VCR cabinet, both \$150 OBO, will sell sep. 480-5060.

Heavy duty GE washing machine ex cond, \$150 OBO. Ken, x49845 or 332-9197.

Lg drawer chest w/desk pull-out and shelf for TV, approx 78" x 36", \$95; Tudow style blanket chest, \$50. 332-1614.

Maple BR suite, 2 twin beds, night stand, dresser w/mirror, \$350. x36378 or 992-3752.

Kg sz 4 poster waterbed w/acces, dk finish, ex cond, \$100. 996-8939.

Whirlpool washer and dryer, good cond, heavy duty, \$250/set, can separate. 641-5315.

Vacuum cleaners, 1 Hoover self propeller and 1 Hoover Dial-A-Matic w/attachments, both ex cond, 286-8822.

GE refrigerator, 1.6 cu ft, dorm sz, 22" x 20" x 18", walnut color, \$80. x30246.

Qn sz water bed frame w/regular firm mattress, 6 drwr pedestal, mirror hdbd, \$150 OBO. Stephanie Wells, x49810 or 474-2896.

Sears lg capacity elec dryer, all cycles, good cond, \$100. Fran, 282-5266.

Entertainment center, \$200; 2 LR chairs, \$60; Tom Clancy's *Without Remorse* book on cassette, \$19. 486-2414.

Sleeper/loveseat sofa, new cushions and custom slipcover, \$50; ivory Southwest style, 3 cushion sofa, \$50. 554-6379.

Wanted

Want riders to join VPSI vanpool, depart Meyerland Park & Ride 7:05 am for JSC, work hours 8 am to 4:30 pm. Travis Moebes, x45765 or Don Pipkins, x35346.

Want female roommate to share 3BR house, LC/Landing, \$300/mo + 1/2 util, Cathy, x47802 or 554-4579.

Want sm econo car or truck, basic mech work ok, for single father. 488-8126.

Want exerciser bike w/timer, odometer, speedometer. x30122.

Want roommate, male preferred, respon, mature, \$250/mo + 1/2 elec. x47325 or 335-1710.

Want to buy original 8-bit Nintendo, also Mike Tyson's punchout. 721-6054.

Want left handed acoustic guitar. 326-2307.

Want M/F non-smoker roommate(s) to share spacious LC 4-2.5-2, negotiable. x31456 or 538-1596.

Want amateur jazz musicians to jam. Andy, x34423.

Want antique bath tub. x38843 or 409-925-5011.

Want inexpensive old cedar chests, wooden boxes, trunks, appearance not important, for storage in country shed. x48511.

Want sm tractor and mower or lg riding lawn mower. Tim, x38843 or 409-925-5011.

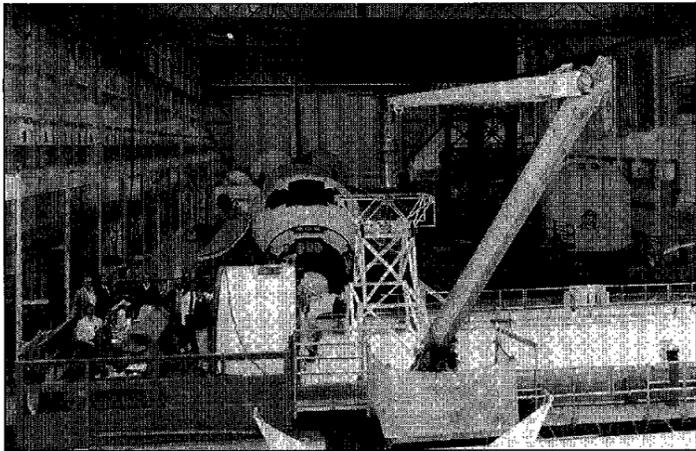
Want used sofa bed, single sz. 941-3262.

Miscellaneous

Remote control

January

The old Manipulator Development Facility ends a 20-year career training astronauts. Its final run tested the feasibility of mating the space station mobile transporter with the shuttle's unpressurized berthing adapter. Three weeks later the new MDF began operations in Bldg. 9 North. ■■■▶



◀■■■ **December**

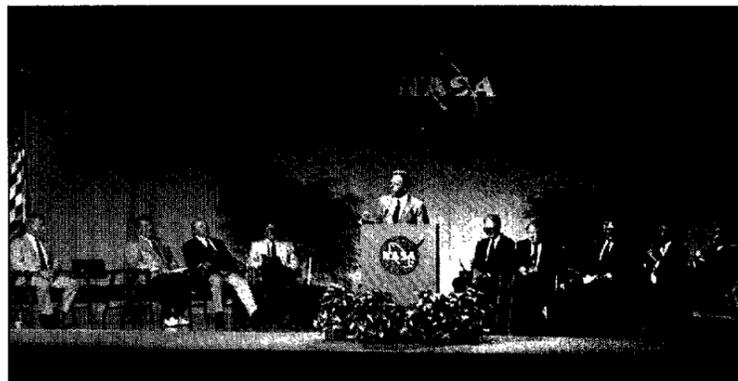
The year ends with the successful servicing of the Hubble Space Telescope. At a welcome home ceremony at Ellington Field crew members, from left, Story Musgrave, Tom Akers, Kathy Thornton, Jeff Hoffman, Claude Nicollier, Ken Bowersox and Dick Covey acknowledge well wishers.

1993 THE YEAR IN PICTURES



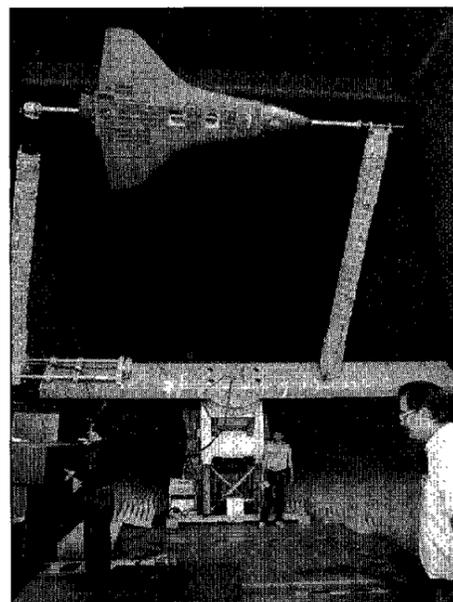
May

One of several girls participating in the "Take Our Daughters to Work Day" takes a turn testing the next generation of computer technology with the virtual reality equipment in the Software Technology Laboratory at JSC. ■■■▶



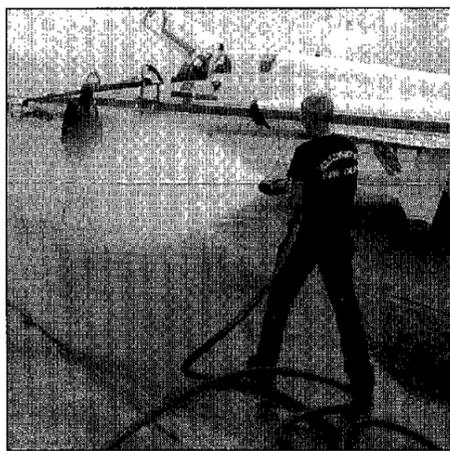
▶■■■ **February**

Russian cosmonaut Vladimir Titov, left, finishes up his first T-38 familiarization ride with JSC Pilot Roger Zwiag at Ellington Field. Titov and fellow cosmonaut Sergei Krikalev were beginning training for a flight on STS-60 set for February 1994. Titov is the backup mission specialist to Krikalev.



◀■■■ **March**

Lockheed employees Larry Johnson, Romeo Sanchez and Larry Dolson set up a one-tenth scale space shuttle mockup in the Bldg. 14 Antenna and Tracking Development Laboratory's anechoic chamber in preparation for an antenna pattern test. Subsystem Manager Al Steiner said his team is looking for a location on the shuttle for a new higher frequency UHF antenna that will move shuttle transmissions out of military frequency bands.



▶■■■ **June**

A memorial honoring Donald K. "Deke" Slayton is held at Teague Auditorium. Friends and colleagues gathered to remember Slayton's life and contributions to the space program. From left are Acting Center Director Paul J. Weitz, Mercury, Gemini and Apollo astronaut Wally Schirra, comedian Bill Dana, friend and fellow pilot, Dusty Dowd, Mercury and Apollo astronaut Alan Shepard, Space Services Inc.'s David Hannah, Russian cosmonaut Alexei Leonov, Mercury astronaut and Sen. John Glenn, former NASA colleague Bob Thompson and NASA Administrator Daniel S. Goldin.



▶■■■ **July**

Retiring astronaut Guy Bluford is hoisted down following his final T-38 flight as a NASA astronaut by an Ellington Field fireman. Bluford, the first African-American in space, resigned in July to join NYMA Inc., of Greenbelt, Md.

▶■■■ **August**

The first international class of astronaut candidates poses at Space Center Houston. The class included mission specialists from Canada, Europe and Japan.



▶■■■ **April**

Earth Day 1993 features a visit from an American alligator. Dale Martin of JSC's Imagery Sciences Division and a volunteer at the Houston Zoo, shows off the alligator to a group of children during Earth Day activities in Teague Auditorium.

November

STS-58 commander John Blaha and his wife Brenda pay tribute to the hard work of Payload Commander Rhea Seddon and Mission Specialist Shannon Lucid at a welcome home ceremony at Ellington Field. ■■■▶



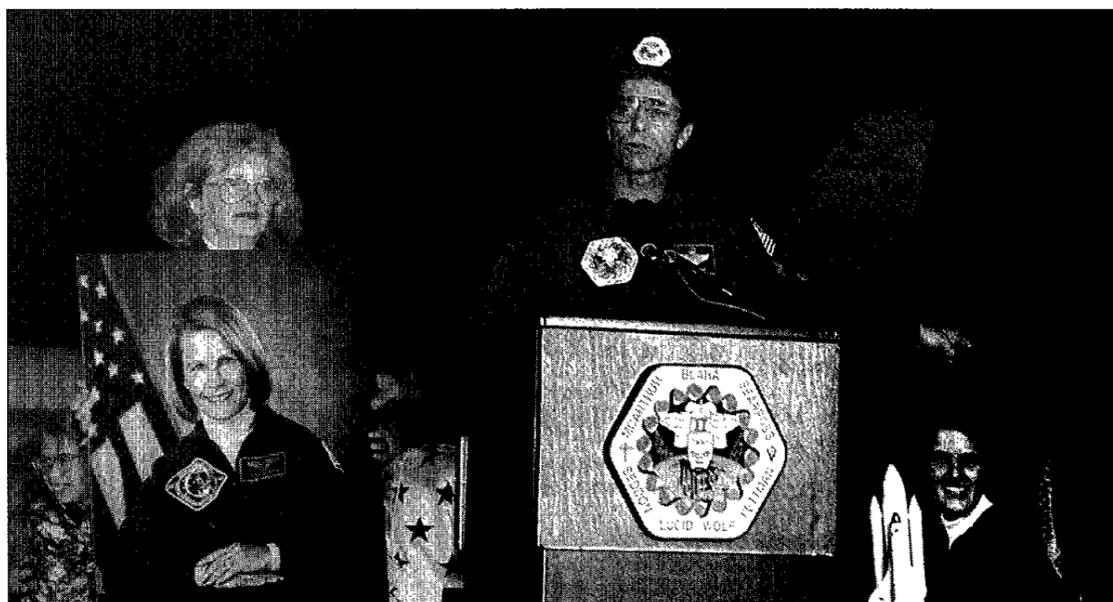
◀■■■ **September**

Rep. Jack Brooks wishes Aaron and Ruth Cohen farewell at Cohen's retirement gala. Cohen left NASA to become the Zachry Professor of Engineering at Texas A&M University.



October

Sen. Charles Robb gets a demonstration of the middeck airlock in the Full Fuselage Trainer in Bldg. 9 from astronaut Dave Walker. Robb is the son-in-law of late President Lyndon B. Johnson for whom the center is named. ■■■▶



Cosmic Background Explorer ends study of the universe

The last operational instrument on board the Cosmic Background Explorer spacecraft was turned off last month ending four years of landmark research by the first probe designed to address the basic questions of modern cosmology.

COBE's primary science mission requirement was for one year of observation.

Project Scientist Dr. John Mather said COBE "has observed the universe as it was at its birth. It's done everything we asked it to do, and it's a proud day for us to declare our

flight operations complete."

COBE's primary scientific objectives included observing the origins of the universe, and searching for the glow from the first stars and galaxies in the universe. Data provided by COBE supported the Big Bang theory that the universe was created about 1.5 billion years ago in a violent cosmic explosion.

Three instruments on board COBE provided data to scientists studying the mysterious conditions present in the early universe and its subsequent evolution into stars and galaxies. Near the end of its first

year in space, the liquid helium coolant needed by two of COBE's three instruments was exhausted, leaving one instrument and some channels of a second instrument operational.

The Far Infrared Absolute Spectrophotometer was used in accurately measuring the spectrum of the Cosmic Microwave Background. Since these measurements showed no deviations from the spectrum predicted by the Big Bang theory, it is known now that 99.97 percent of the energy of the universe was released within the first year after

the Big Bang itself.

Data from this instrument also revealed the temperature of the afterglow of the radiation from the Big Bang some 15 billion years ago has cooled to 2.726 degrees above absolute zero, with an uncertainty of only 0.01 degrees. At the moment of the Big Bang, the temperature of the universe was trillions upon trillions of degrees.

The Differential Microwave Radiometers detected primordial hot and cold spots in the Big Bang radiation. This first detection of primordial seeds will form the basis of

scientific understanding of how matter was able to form into galaxies, clusters of galaxies and superclusters of galaxies, as well as huge empty spaces devoid of galaxies. The final instrument, the Diffuse Infrared Background Experiment was used to search for the glow of ancient stars.

COBE was launched on Nov. 9, 1989 on a Delta rocket. The probe will be used as an engineering training and test satellite by Wallops Flight Facility beginning this month when spacecraft controllers conclude engineering operations.

Original computer staff reunites after 30 years

By Kelly Humphries

Thirty years ago, computers less powerful than the ones that sit on almost every desk at JSC today would fill a whole room.

But there's a group of JSC employees who remember working three shifts a day to provide general computer support for everything from spacecraft trajectory development to information systems using programming languages such as FORTRAN-4 and COBOL. All of the programming and data for the computer had to be keyed into punch cards by support staffers at Ellington Field.

The group got together in Bldg. 12 last month to celebrate the 30th anniversary of the founding of the Information Systems Section of JSC's Computation Analysis Division.

Although John Leonard has retired, the rest of the seven original

members of that section still work at JSC in a variety of capacities. Jackie Fisher, Charles Krpec, Karen Clark, Josephine Jue and Richard Kruse joined Leonard for the reunion of the first section to spend time working on a computer for what was then the Manned Spacecraft Center. Charles Mains was unable to attend.

All joined the MSC as computer programmers, Leonard said, and worked at first on an IBM 7090 computer that was housed in a parking garage at the Herman Professional Building at the Texas Medical Center.

Next, the section worked out of an abandoned television studio on the University of Houston campus before moving on-site to Bldg. 12 in the fall of 1963. Soon afterward, the became a branch and expanded its work to include payroll and administration.



JSC Photo

Original members of the Information Systems Section at JSC gather on the landing of the Bldg. 12 stairway for a 30th anniversary group photo. From left are Jackie Fisher, Charles Krpec, Karen Clark, John Leonard, Josephine Jue and Richard Kruse.

Employees and contractors receive Space Act Awards

More than 20 JSC employees and contractors recently were honored at special ceremonies for the Space Act Awards.

The awards, which carry with them various monetary stipends, are given periodically. During the most recent ceremony Acting Center Director Paul J. Weitz presented the Patent Application Awards and Board Awards to 15 JSC employees and 8 contractors.

Patent Application Awards went to John D. Cornwell, William D. Harwell and Eugene K. Ungar for Geometrical Vapor Blocker for Parallel Condensation Tubes Requiring Subcooling; Thomas J. Goodwin and Glenn F. Spaulding for Recombinant Protein Production and Insect Cell Culture; and Kent D.

Castle for Extra-Corporeal Blood Access, Sensing, and Radiation Methods and Apparatuses.

Board Awards were presented to Donald L. Henninger, Douglas W. Ming and D. C. Golden for Active Synthetic Soil; Karen L. Nyberg for Robot Friendly Probe and Socket Assembly; Brian G. Morris for Magnetically Operated Check Valve; S. Douglas Holland for Electronic Still Camera; Richard D. Juday for Full Complex Modulation Using Two One-Parameter Spatial Light Modulators; and Deborah L. Harm, Millard F. Reschke, Donald E. Parker, William G. Crosier, Noel C. Skinner, Kathleen M. Duncan, John W. Worthington, Freddie G. Ferrara, Jill T. Kuennen and Linda J. Zografos for Preflight Adaptation Trainers Project.

Commercialization of space age technology topic of conference

A "Dual-Use Space Technology Transfer Conference" highlighting commercial applications of space technology is slated to begin Feb. 1 at the Gilruth Center.

The goal of the conference "is to closely bridge the space community with industry," said Kumar Krishen, program co-chair and chief technologist in the New Initiatives Office.

Commercial applications of space technology have resulted in "more than 30,000 spin-offs or second-hand uses of this technology."

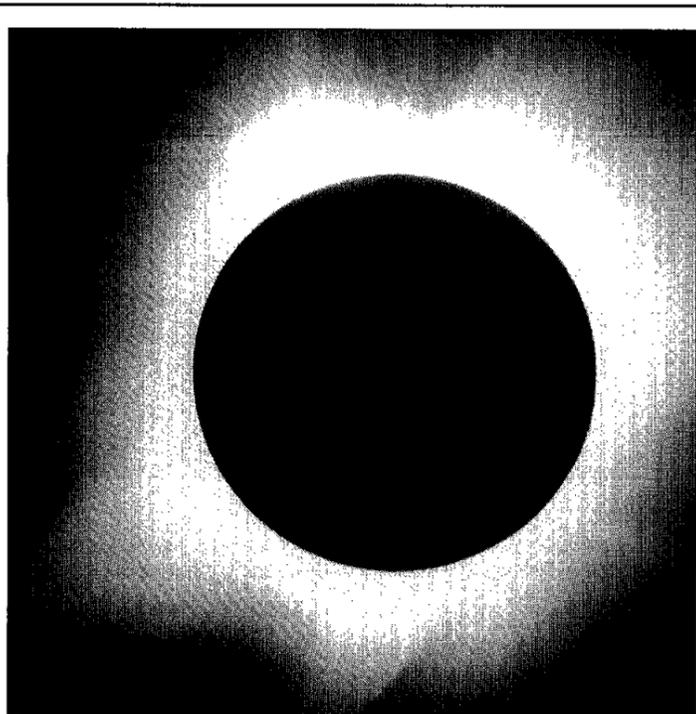
More than 30 exhibits and 100 papers will be presented promoting technology transfer from the space program to business and industry. Technical areas providing an opportunity for commercial devel-

opment include software and computer technology, human support technology, avionics, guidance and control, communications and data processing, medical and life sciences and technology transfer.

"NASA is excellently posed to share its research and technology with the nation's industrial community," said Krishen. "This conference is intended to inform industry of our existing programs and available mechanisms for technology transfer."

The three-day conference begins at 7:30 a.m. Feb. 1 at the Gilruth Center. Cost is \$225 for all three days or \$100 for a single day.

For additional information on conference events or registration, contact I-Net at 286-2102.



A total eclipse of the sun as viewed from Santiago Ixcuintla, Mexico in July, 1991. The JSC Astronomical Society is planning a trip to Peru to observe a similar eclipse late this year.

View a total eclipse of the sun

The JSC Astronomical Society is planning a trip to the mountains of Peru to view a total eclipse of the sun late this year.

This expedition marks the 16th time the star gazers have traveled to view the drama of a total eclipse. The trip to Arequipa, Peru runs from Oct. 31 through Nov. 4. Sky watchers will observe nearly three minutes of darkness from a

site 4,000 feet above sea level.

Participants also have the opportunity to visit the ancient Incan ruins at Machu Picchu, the infamous Nazca Lines and the Galapagos Islands while on the expedition. For additional information, call George Weller at 480-1988. The next eclipse expedition is set for October 1995 near the Taj Mahal in India.

Saturn Lane patrolled by local police agencies

JSC employees and contractors who take advantage of light traffic conditions on Saturn Lane to speed may discover the flashing red lights of a police car behind them.

JSC Security Operation Branch Chief Bob Gaffney recently reminded all employees the posted speed limit on Saturn Lane, which borders the south perimeter of JSC, is 50 miles per hour. Individuals exceed-

ing the posted speed limit may be ticketed by any law enforcement agency including the Houston Police Department, the Constable's Office, or Sheriff's deputies.

Property outside the new JSC south perimeter fence, including Saturn Lane, was ceded to the City of Houston in 1992. Metro funds were used to upgrade Saturn Lane, formerly Avenue E, to a multi-lane

avenue which passes by the JSC main entrance. JSC, however, has no jurisdiction over the intersection, traffic lights, or traffic enforcement on Saturn Lane.

As a city street, local police enforce the law on Saturn Lane in the same manner as it is exercised on other city streets surrounding the Center. So speeders be warned, tickets issued by police outside the

JSC fence will be applied against state driving records and may require an appearance before a magistrate. "The full weight of the law can be applied for traffic violations on Saturn," said Security Operations Branch Chief Bob Gaffney.

Employees are encouraged to observe all posted speed laws and to drive safely and courteously.

Tool slated for Space Technology Hall of Fame

A computer software tool developed in JSC's Software Technology Branch is among the nominees for induction into NASA's Space Technology Hall of Fame.

Two of the 10 nominated technologies and the people who developed them will be honored in April during the U.S. Space Foundation's 10th National Space Symposium Space Technology Hall of Fame Dinner in Colorado Springs.

JSC's nominee, the C Language Integrated Production System, is a tool that integrates expert systems programs with conventional computer programs.

The development team, led by Bob Savely, now chief scientist for advanced software technology in JSC's Information Systems Directorate, included Chris Culbert, Bebe Ly, Chris Ortiz, Gary Riley and Frank Lopez.

CLIPS is distributed to private sector companies through NASA's Computer Software Management and Information Center.

NASA estimates there are more than 10,000 commercial users with applications in aerospace, genetic engineering and agriculture, as well as the military and other government agencies.

American Airlines, for example, developed a system using CLIPS that recommends contingency plans when schedule reductions must be made.

The rest of the nominees are an automated waterjet stripping system developed at Marshall Space Flight Center; digital imaging, laser angioplasty and a rapid measurement clinical thermometer, all developed at NASA's Jet Propulsion Laboratory.

The electron (ion) beam generators and magnetic fluids called ferrofluids, developed at the Lewis Research Center were also nominees.

And a Goddard Space Flight Center-developed transportable applications environment was nominated along with an underwater location aid developed at Langley Research Center, and hang gliders first developed by an employee of the National Advisory Committee for Aeronautics, NASA's precursor.

Space News Roundup

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